

Mapping Alekano Place Names in Gamiga Village, Eastern Highlands Province, Papua New Guinea

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Language Background

Alekano (ISO 639-3 [gah]) is a Trans-New Guinea language spoken in and around the town of Goroka in the Eastern Highlands Province of Papua New Guinea by some 25,000 people (Lewis et al. 2014). The language status is classified as 7 (Shifting) on the EGIDS scale, as younger generations are learning and using Tok Pisin for regular communication. Previous documentation of the language, conducted primarily by SIL linguist Ellis Deibler (publications from 1963-2008), includes a small-scale map of most but not all of the Alekano language area. To the authors’ knowledge, no map exists printed in the Alekano language on the scale of a single village.

Project Summmary

The authors undertook a pilot project to explore methodology for more detailed place-based documentation of the language by focusing on place names in one particular village. Bryan Kayho is a native speaker and Alekano language activist in Papua New Guinea who accessed his own local knowledge and that of elders in his home village to compile the names of over fifty locations (landscape features and regions) within the village of Gamiga, just outside of Goroka. The authors mapped this information in a crude format using a portable handheld scanner and Adobe InDesign. The information was subsequently integrated into a more streamlined presentation using geographic information systems (GIS) technology, a digital tool for storage, analysis, and visualization of geospatial information. This project set the groundwork for follow-up place-based documentation in Gamiga, and the methodology can be applied to similar projects in the Alekano language area and in other endangered language communities.

Data Collection

1. Acquired a map of the general area (by visiting the district office in Goroka, which provided a black and white photocopy of a detailed topographic district map).
2. Scanned the map using a portable handheld scanner and transferred the file onto a personal/work laptop computer.
3. Zoomed in on Gamiga village, selected the area of interest, and created a new image file of the selected area. (Figure 1)
4. Opened the newly created image file in Adobe InDesign.
5. Traced over the map image with salient geographic features (e.g. rivers, roads, and peaks) using identifiable colors and symbols. Noted down the Alekano name of each feature on the map. (Figure 2)
6. Removed the background map image (the topographic district map).
7. Identified and labeled 48 different land areas within the region. The numbers 01-48 were used as identification codes, and a separate key was created with the Alekano names of each. (Figure 3)

Why QGIS?

Using simple functions in a program like Adobe InDesign works for basic place-based documentation and initial map creation in the field. However, integrating these data into a GIS creates a more transferable and analyzable record of geolinguistic information. There are two primary options for GIS software that can be used for this purpose: ArcGIS and QGIS. QGIS was used for this project as it is free, open-source, can be downloaded and installed on any operating system. It is also thought to be more approachable than ArcGIS for less experienced users, and it interfaces readily with free web-based mapping resources like the Google suite and OpenStreetMaps.



Figure 1. District map scan (zoomed in on Gamiga)

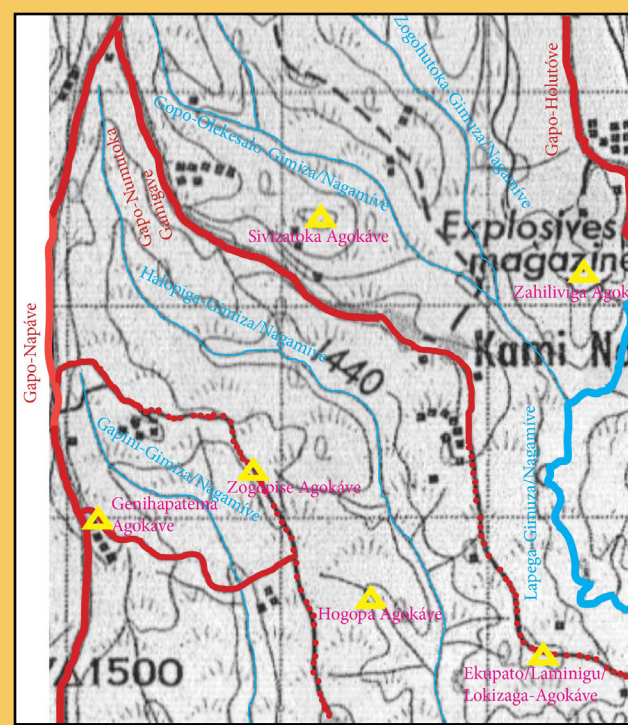


Figure 2. Salient features overlaid on district map

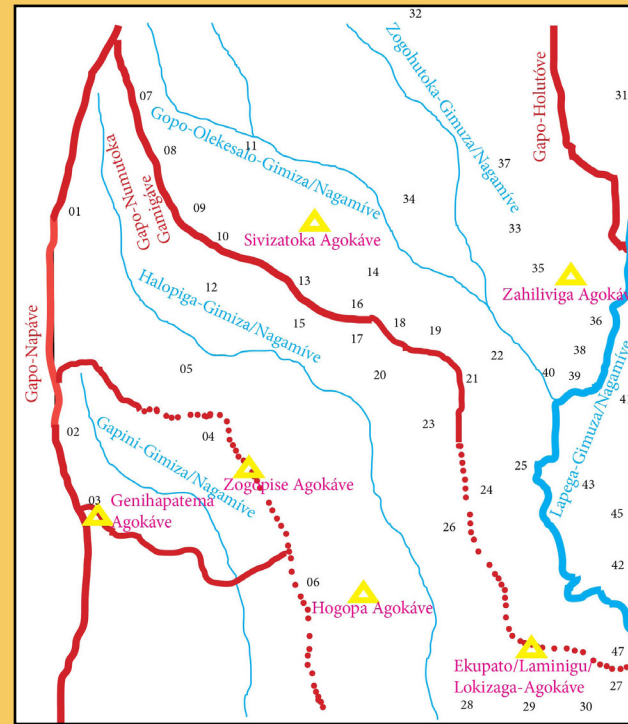


Figure 3. Crude map created through data collection in the field

Gamiga Mikasímini Agulizáve

- 01 Gulahime-nagami
- 02 Gohekoheto
- 03 Genihapatema
- 04 Gusavetoni
- 05 Semégoiha
- 06 Saha-akepa
- 07 Gitegeha
- 08 Golapa gisegise
- 09 Gimalimo-akepázizimo
- 10 Namopa-agokalo
- 11 Gopo-gimuzau
- 12 Alumuzo-nagami
- 13 Goipalo-agokalo
- 14 Openaluga
- 15 Masu-nagami
- 16 Lopeha-Sekelolelo
- 17 Izá Omasi
- 18 Moné aímuki
- 19 Metepuluga
- 20 Ozahá netaku
- 21 Gatanuto
- 22 Seikosalo
- 23 Lagakuka
- 24 Ekupahelaló
- 25 Omasí heleakaku
- 26 Zolilikeni
- 27 Zamunogo
- 28 Zotuhau
- 29 Namá ohato
- 30 Nukenukeluga
- 31 Gipá lape-Moholape
- 32 Pakeloka
- 33 Ipá guve
- 34 Sekavelugá
- 35 Galá gehato
- 36 Sipilonuga
- 37 Mono Veloku
- 38 Mulumulú mato
- 39 Hepé tumane
- 40 Givigu
- 41 Gilelehani
- 42 Sohavoto
- 43 Lopatenáu
- 44 Alatigu
- 45 Sigozalo
- 46 Ukunaga
- 47 Gehaga
- 48 Gamiga

Procedure

Step 1 - Determine a map projection. (This may require trial and error). WGS 84 / Pseudo Mercator (EPSG: 3857) worked best in trials for this project.

Step 2 - Load basemap(s). OCM Landscape (OpenStreetMap’s topographic basemap) was primarily used in this project.

Step 3 - Georeferencing (assigning geospatial coordinates)

1. Preparing the file: Zoom in on the part of the basemap that corresponds to Gamiga village as represented in the field map, open the georeferencing window (Raster → Georeferencer → Georeferencer...), then open the image map file and set its CRS to be consistent with the overall project CRS when prompted.
2. Adding control points: In the Georeferencer window, click the “Add point” button. Then click on an identifiable point on the image to be georeferenced, select “From map canvas” in the popup dialog box, and select the corresponding point on the basemap. Accuracy is important, as is choosing points that are likely to stay consistent between maps, e.g. road intersections rather than rivers which may change course. Keep in mind that increased precision on the user end can only improve precision to the extent that the data are already precise. Work diagonally, placing a point in all four corners.

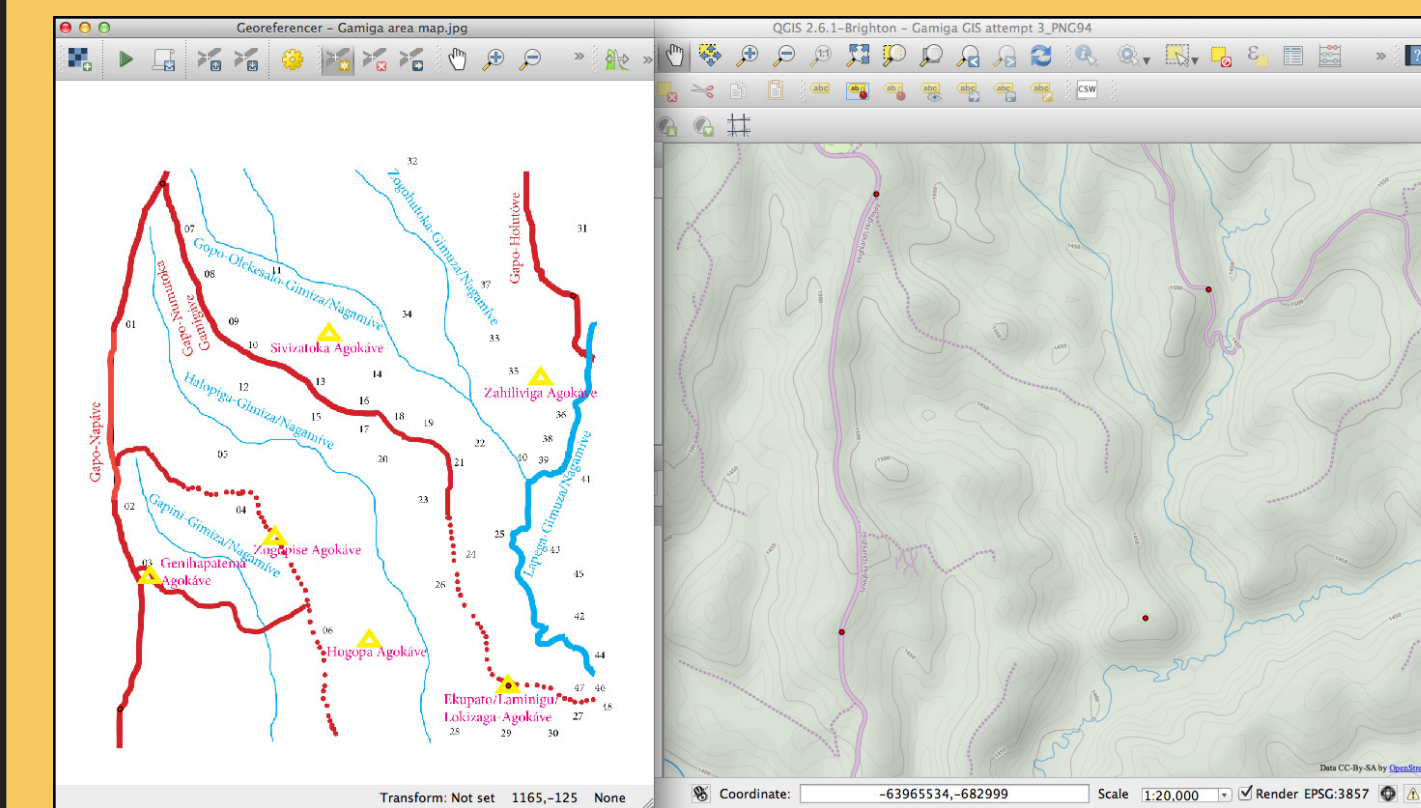


Figure 4. Adding control points (georeferencing window and map canvas)

3. Settings: Click the “Transformation settings” button and select settings for georeferencing and creating a new image file for the map. The settings used for this project were: Thin Plate Spline (Transformation type), Nearest neighbor (Resampling method), and DEFLATE (Compression). Add a name in the Output Raster field and make sure the Target SRS matches the CRS defined earlier for the project.

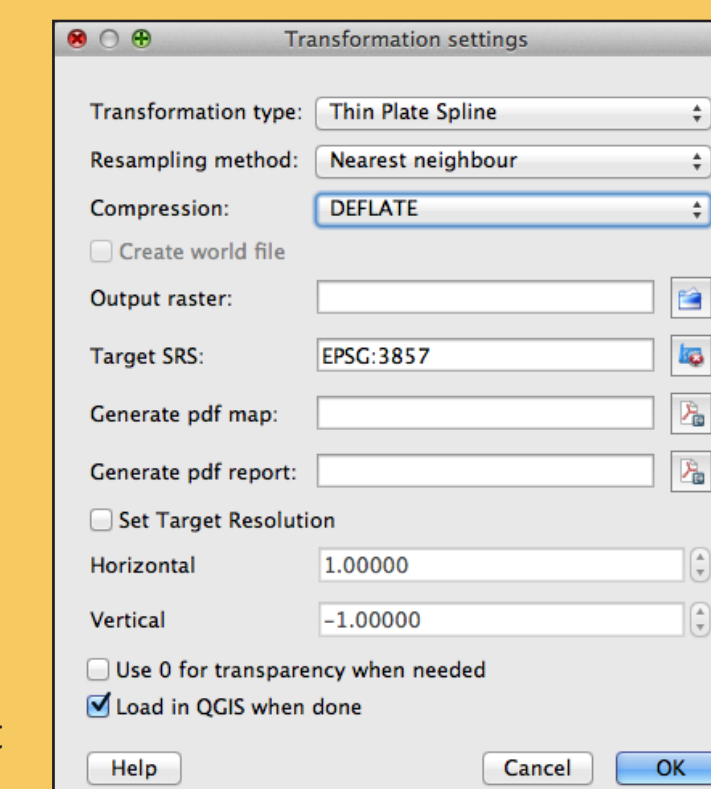


Figure 5. Transformation Settings

4. Final stage: Click “Start georeferencing” and wait momentarily while the program georeferences the image file. If “Load in QGIS when done” was checked in the Transformation Settings window, the raster file will appear in the correct location on the QGIS canvas. (Figure 6)

Step 4 - Adding Features

1. Raise transparency: Raise the transparency of the raster image so that features on the basemap are visible. (Figure 7)
2. Create a new layer: Layer → Create Layer → New Shapefile Layer... (New Spatialite Layer could be used instead, but Shapefile layers were chosen for this project). Create one layer for each feature category (e.g. mountains, roads, rivers, and land names). For this project, “point” was used as the layer type for representing mountains and land names, and “line” was used for rivers and roads. Create and name attributes that are relevant for each layer (at least one attribute for feature names and optionally more for attributes such as relative feature size) in the layer creation dialog box.
3. Add features: Add features to the map by highlighting the layer that the feature will be in, clicking the “Toggle Editing” button then the “Add Feature” button in the Digitizing Toolbar. The program will know based on the layer selected whether to create a point, line, or polygon feature. For point features, click on the point on the map where the feature will be added, then enter attribute data in the information fields that appear. For line features, left click several points to trace the shape of the line on the original map, then right click to complete the feature (and enter attribute data in the information fields).
4. Editing: After creating a feature, it may be apparent that one or more nodes in that feature are misplaced. In this case, it is possible to edit the feature by selecting it (“Select Features” button), then clicking on the Node Tool in the Digitizing Toolbar to select individual nodes within the feature to alter or delete. Right clicking on each layer and selecting “Properties” opens a dialog box for altering the appearance (color, size, symbols, label properties like font, etc.) of features within the layer.

The data are now georeferenced and ready for use in QGIS!

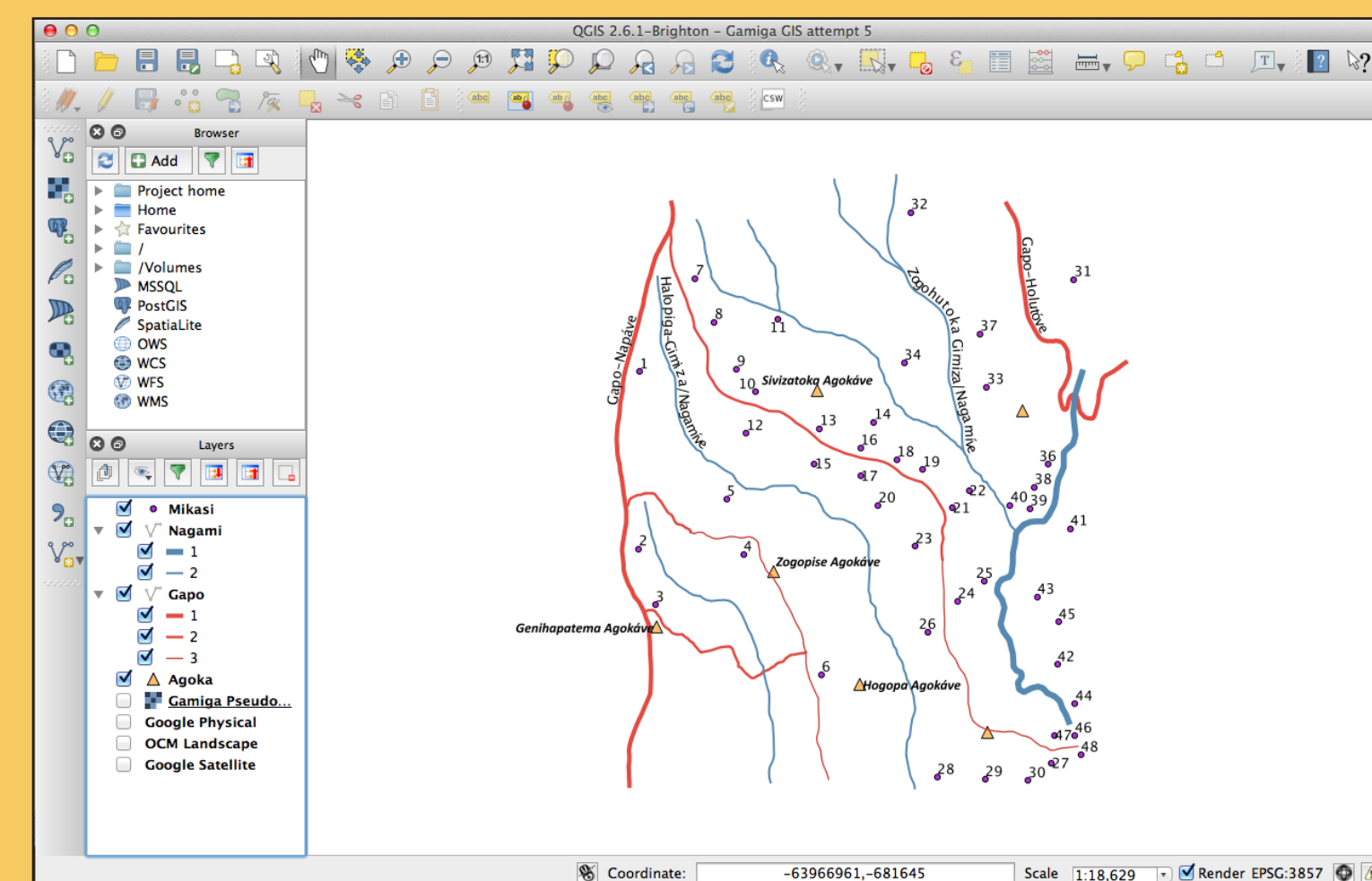


Figure 8. Georeferenced features with labels

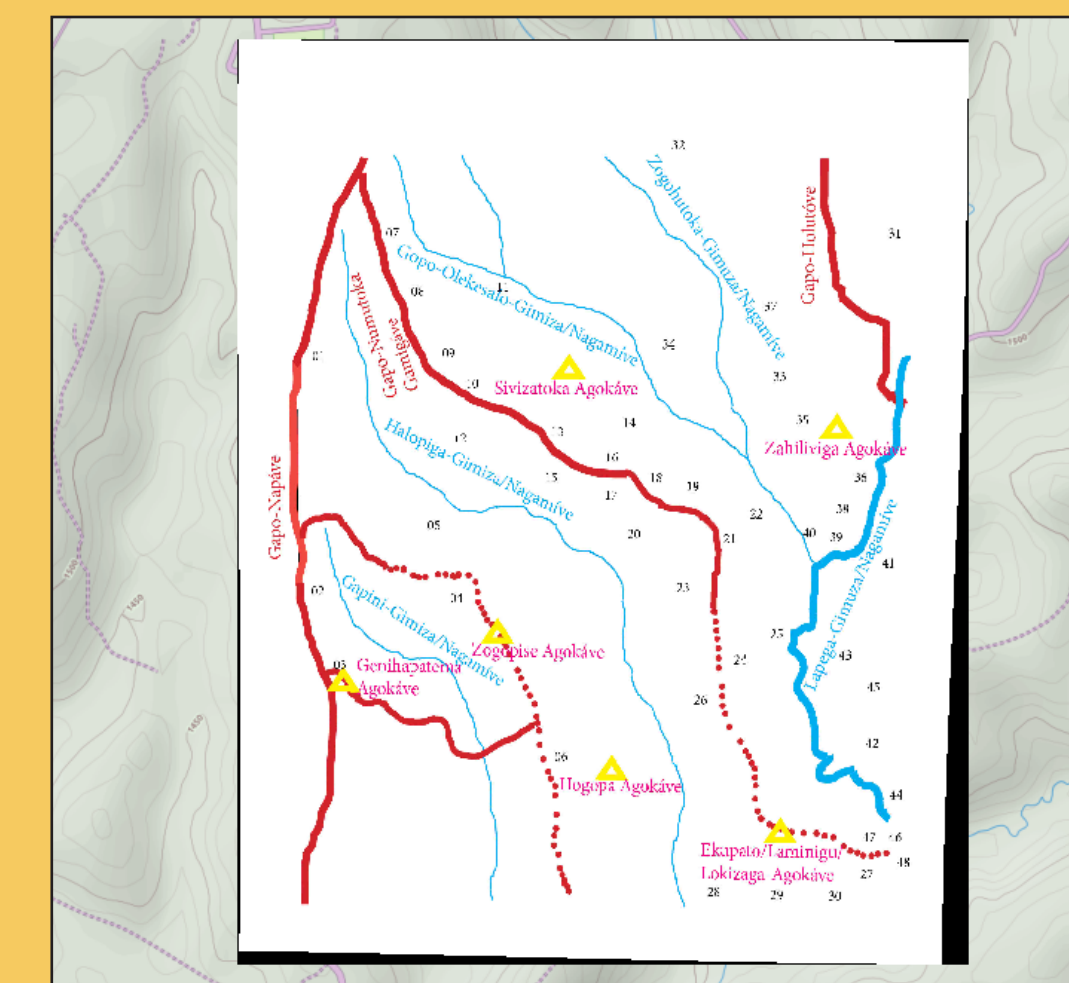


Figure 6. Georeferenced image on map canvas

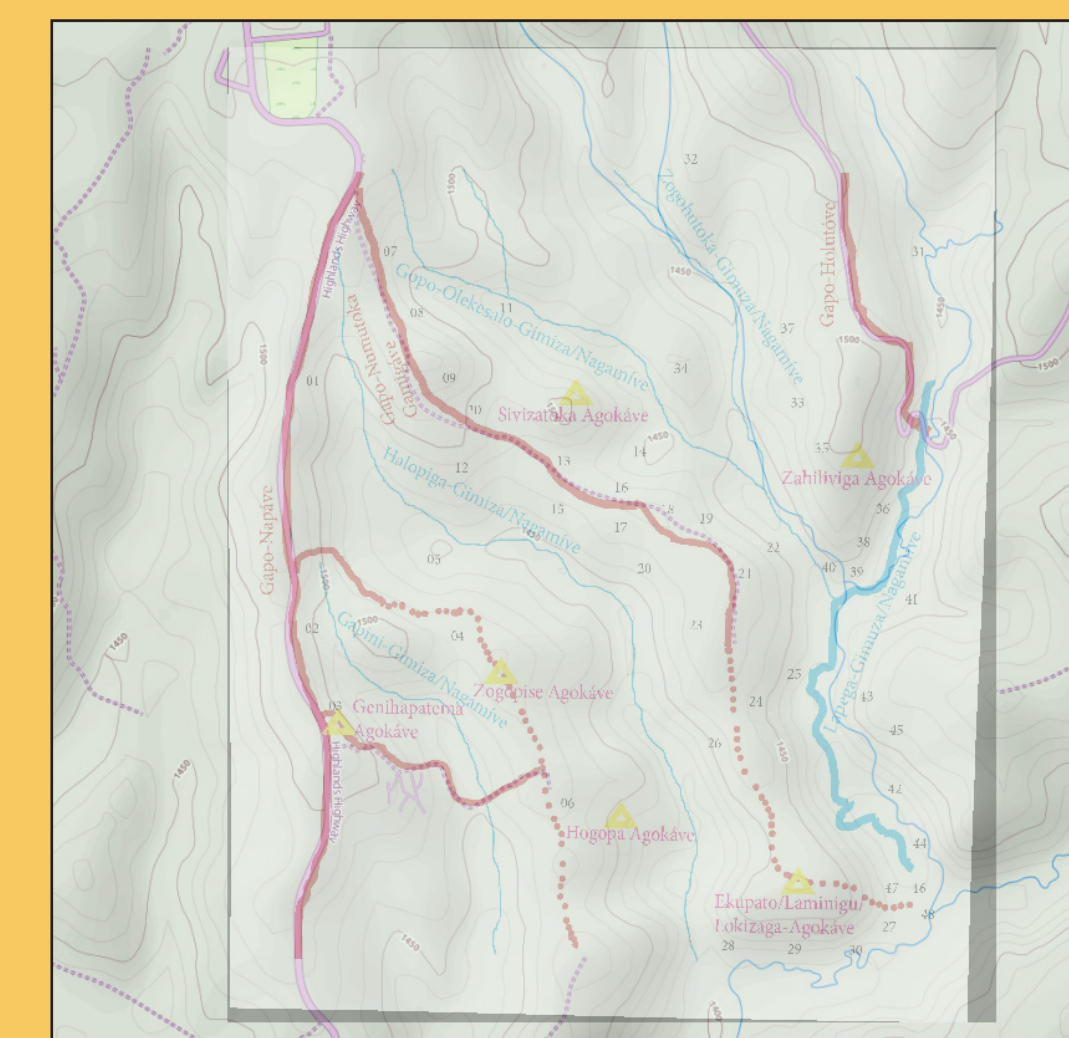


Figure 7. Georeferenced image with high transparency

Useful Links

QGIS User Guide:
http://docs.qgis.org/2.6/en/docs/user_manual/

Georeferencing:
<http://www.digital-geography.com/qgis-tutorial-i-how-to-georeference-a-map/>

<http://glaitik.org/2011/03/27/image-georeferencing-with-qgis/>

Digitizing:
http://www.qgistutorials.com/en/docs/digitizing_basics.html

QGIS Vector Layer Editing:
http://docs.qgis.org/2.6/en/docs/user_manual/working_with_vector/editing_geometry_attributes

Conclusions

This pilot project is an example of how place-based language data can be collected in the field and later integrated into a GIS, which is useful for detailed geolinguistic analysis, transferability of geolinguistic data, and production of professional quality language-specific maps. The the geographic accuracy of the data would be improved by collecting coordinate reference points using a handheld GPS unit in the field. However, the method developed through this project may be an acceptable substitute when GPS data is not available. The final maps will hopefully serve as references for further place-based language documentation in Alekano, constituting a part of the language’s archive, and laminated versions will be provided to members of the community as beautiful and functional gifts. The basic stages of this data collection and digitization process are presented so that others might improve upon the methodology and expand its applications.

References

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- Deibler, Ellis. 2000. How to Speak Alekano. Ukarumpa, EHP, Papua New Guinea: SIL Press.
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- Lewis, M. Paul, Gary F. Simons, and Charles D. Fennig (eds.). 2014. Alekano: A Language of Papua New Guinea. Ethnologue: Languages of the World, Seventeenth Edition. Dallas, Texas: SIL International. Online version: <http://www.ethnologue.com>.

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Segá neve!

